Agricultural development; Opportunities and threats for farmers and implications for extension organisations

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Abstract

In many countries agriculture is in a process of rapid change,
– it has to meet a growing demand for food in a sustainable way,
– the international competition is increasing,
– the increase in labour productivity is decreasing the employment opportunities in agriculture,
– agricultural research is offering many new opportunities to increase productivity,
– government price support for agricultural products in industrial countries is decreasing.
These changes have many implications for agricultural extension, such as:
– the knowledge and capabilities of farmers has become a major factor in their ability to compete in national and international markets,
– advice is not only needed on the adoption of new technologies, but also on many other decisions farmers have to make, such as the choice of their farming system and the decision whether or not to earn an income from outside agriculture,
– this requires a change in extension methods and in the information sources extension agents use,
– agricultural development demands painful changes in the way of farming and of living for many farm families. It is a challenge for extension agencies to help farm families to realise this,
– a major task for leaders of extension organisations is to manage a process of change in agricultural extension. Often the role extension has to play in agricultural development can not be performed by one extension organisation, but only by a pluralistic extension system.
Agricultural extension is often expected to contribute to a reduction of poverty among farmers and farm labourers. One has to think seriously how one can realise this objective.
J Agr Educ Ext (1999, 6, 3, pp 145-156)

1. Introduction

One of the most important tasks of an extension organisation is to choose the goals of the extension programme. One of the roles of an extension organisation is to contribute to the development of agriculture in their area by helping farmers to become timely aware of the changes in their environment which offer new opportunities for agricultural development but which also cause threats, because it is no longer possible to earn a decent income with the present way of farming. Choosing the goals of an extension programme includes judgement on which kinds of developments in agriculture are possible and which are not, and which are desirable. This judgement is partly based on knowledge, for example, of new technologies which become available and partly on opinions, for example, whether or not it is desirable to replace family farms by large scale farming.

With this article I am trying to support extension officers in making decisions on the goals of their extension programme by analysing some of the major developments in agriculture and their consequences for farmers and society in order to stimulate the discussion on the desirability of these developments. Clearly, it is not possible to come to any final conclusions, as these developments are different in various countries. I hope that this article will help extension officers

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to discuss these issues in a systematic way with various agricultural scientists, policy-makers and farmers.

I will discuss some of the major developments in agriculture and their implications for the strategy of extension organisations. A difficulty I encountered in discussing these developments is that they are often interrelated, but for clarity purposes I have had to discuss them separately.

2. Demand for food

In many developing countries the demand for food increases rapidly not only because of population growth, but also because in several of these countries incomes are increasing and therefore people are able to eat more expensive animal and horticultural products. The IFPRI (1995) expects a doubling of the demand for food at a world wide scale in about 20 years. In most countries this increased demand will have to be met by an increased local production. A country as Singapore is able to import the food it needs, as this country now has a higher average per capita income than the European Union. This makes it easy to raise the foreign exchange needed for these imports, but most developing countries cannot do this. In addition, if countries with a large population, like China or India, would import only 10% of the food they need, world market prices would rise considerably.

In many countries the growing demand for food requires a rapid increase in the food production compared to the increase which has been achieved in the past. It will be difficult to realise this increase because:
– a good deal of the present agricultural production is not sustainable (See p. 149),
– much of the increase in the past decades has been realised by bringing more land in cultivation and/or by irrigating more land. The availability of land and water will often makes it impossible to continue to do this,
– some of the land which is cultivated at present will be taken out of production either because of urban development or because for its cultivation it requires so much labour that this is no longer profitable with the increased wage levels. This may, for example, be the case with many of the rice terraces in mountain areas in Asia.

These changes in demand create opportunities for farmers. If the increase in the production of a product lags behind the increase in demand, the price will increase. Switching from cereal production to horticultural or animal production can often result in an increase in farm income and in employment. However, the government may not like this change, because it can endanger the food security policy and increased cereal prices for consumers can cause political problems. In this situation extension may be the most effective tool the government can use to increase cereal production, by teaching farmers how they can produce more grain at a lower cost.

3. Globalisation of markets and changing market structure

In the past much of the agricultural production was consumed by the farm family which produced it or by people in their village who provided services to this family. Now increasingly farmers are producing for urban consumers in their country and for the world market. They have to compete on the home market with farmers from other countries. For instance, the Netherlands is the major exporter of flowers in the world, but Thai farmers are able to sell their orchids on the market in my home town. They may use the money they earn in this way to buy condensed milk from a Dutch dairy co-operative instead of milk produced in Thailand.

There are several reasons why international trade is increasing:
– transport costs are decreasing and speed is increasing,
– the rapid development of information and communication technology makes it much easier to discover where to obtain the best price for farm products,
– the rules of the World Trade Organization have led to abolishing import duties and other trade barriers,
– in industrial countries people buy most of their food from a supermarket which is now often owned by a multinational company that buys its products wherever it can get the best quality for the lowest price.

The home market is changing in many countries as a result of the rapid rate of urbanisation. This requires the development of an elaborate food

marketing system. In the past most agricultural production was sold as bulk product, but increasingly it is sold under a brand name with many different brands for different target groups and for different ways of using the product. For instance, for a rather simple product as margarine I can choose in my supermarket from 28 different brands of which the most expensive costs seven times more than the cheapest. Understandably the trader, processor and supermarket chain prefer to sell the most expensive product, but they will only succeed in doing so if they can guarantee its quality. This quality will be influenced by what has taken place in previous links in the production chain. Therefore, the company controls the whole chain from the producer to the consumer. The bar code on a package of strawberries in a European supermarket may provide information on which producer in Zimbabwe produced it, when he planted which variety, which fertilisers and pest control measures he used, when he harvested, who packed it when and where, when it arrived in Europe, etcetera. Inspectors check that this information is reliable, because if cheating somewhere in the chain results in a lower quality product, the consumer may change to a competing supermarket. The organisations which control this chain will make the most profit. Are these the farmers through their co-operatives, the multinational plantation companies, the processors or the supermarket chains? Often either the food processor or the supermarket chain makes a contract with farmers, which specifies how much and what and where they will produce, when and in which way and often even what the price will be. This gives the supermarket or the processor some certainty about supply, even though this might be influenced by the weather, and it gives the farmer some certainty about his market (See e.g. Burch and Goss, 1999).

4. Price policies

Through government policies in industrial countries many farmers get a higher price for their product than the world market price, whereas in developing countries they usually get a lower price. There the government policy is to keep the food prices low for urban consumers, who have more political power than the rural people. The price policies in the industrial countries are an important reason why these countries produce surpluses of many agricultural products. I expect that in industrial countries the price of agricultural products will come much closer to the world market prices than they are at present because:

– the rules of the World Trade Organization are making it difficult to continue to dump surpluses of agricultural products in the market,
– the political power farmers have is decreasing because the proportion of the labour force working in agricultural has become less than 3% in many industrialised countries, and farmers have become more specialised and hence have less common interests,
– the present system of intensive agricultural production causes serious environmental problems. Therefore, politicians have become less inclined to support policies which stimulate this way of production,
– with the increasing diversity in the kinds and qualities of agricultural products it becomes more difficult to implement a price policy for agricultural products.

However, there are some reasons for governments to support their farmers financially:

– nature causes fluctuations in agricultural production. Therefore some surpluses are desirable to guarantee food security, but these can be much smaller than they are now, for example, in the European Union,
– farmers not only produce food, but also maintain the landscape and influence biodiversity. It is fair to pay them for these activities. However, it is usually more effective to pay them for the landscape and biodiversity produced than by higher prices for their products,
– a decrease in the prices of agricultural products could cause serious social problems, because it forces people to leave agriculture and may result in the depopulation of areas where the conditions are not favourable for an efficient agricultural production. Price support may be the cheapest and/or the most effective way to decrease these problems,
– in some countries, for example, Japan and France, the election system gives the rural people more political power than is justified by their numbers.

If the prices of agricultural products in industrial countries decrease considerably this will result in

a lower agricultural production in these countries. This may cause higher world market prices and market opportunities for farmers in other countries.

5. Employment in agriculture

It was shown a long time ago that with increasing average income the proportion of the labour force which can find employment in agriculture decreases (Clark, 1957). If people who are forced to leave agriculture, can find employment in more productive jobs outside agriculture, the national income will increase as a result of this transfer of employment. However, in some countries the only alternative for many is to join the unemployed in the cities. This can cause serious social problems. These problems can also be caused by the depopulation of areas which have unfavourable conditions for agricultural production. To find the right balance between decreasing employment opportunities in agriculture and increasing opportunities outside agriculture is not easy.

One solution is income diversity (Ellis, 1999). There is no reason why a farm family should only earn income in the domain of the Ministry of Agriculture and not in the domains of other ministries. In fact many farmers do this already, for example, in tourism or in local crafts and trade. An advantage is that it decreases the depopulation of rural areas. A difficulty for the government to promote this development is that this requires a good co-ordination between different ministries, and the experience is that changing ministerial bureaucracies is more difficult than changing farmers' behaviour.

In many countries there is a tremendous potential to increase labour productivity in agriculture. The World Bank estimates that the range in average added value per worker in agriculture per year is from $ 69 in the Kyrgyz Republic to over $ 41000 in the Netherlands (World Bank, 1998). Realising this potential will require a decrease in the proportion of the labour force working in agriculture. In many countries over 60% of the labour force works in agriculture. As long as this proportion does not decrease drastically the majority of the farm families will remain poor whatever the extension service does to increase productivity in agriculture.

In many countries it are mainly the males who find a full-time or part-time job outside agriculture. Their wives and perhaps their daughters remain in the village to manage the farm. This results in a process of feminisation of agriculture. In most countries the vast majority of the village extension agents are males, who may have difficulties to understand the problems of the women on the farms (Maarse et al., 1998).

6. Farm size

An important question is on developments we can expect concerning the size of the farms. This is important in the former communist countries where the government created large scale state and co-operative farms. These farms had a considerable lower level of productivity than the predominantly family farms in Western Europe. In several of the countries these large farms have been divided among the former workers or the former owners in tiny farms. In other countries most of agricultural production still comes from these large scale farms. Which development is desirable?

Between 1900 and 1980 the average number of workers on a farm in the Netherlands has decreased from 3.0 to 1.5, but since that time the average number has increased again. Factors influencing the optimal farm size probably include:

- how can one produce the quantity of products of uniform quality which a chain of supermarkets and other buyers in the market require? This can be done by a large company as Dole for bananas, or by a group of smaller farms, which co-operate closely,
- how can one provide the factory processing the product with a constant supply of a good quality product? One reason why much of the tea is produced in plantations is that the quality of the leaves deteriorates rapidly after picking. Organising a system for rapid processing is easier from one plantation than from a large number of small farms,
- how can one make full use of costly farm machinery? This can be done either on a large farm or by a custom worker offering services to a number of smaller farms, however, their fields may be to small to use these machines effectively,
- on a farm many of the decisions have to be made at the level of the animal or the level of

the field, for example, for ploughing at the right moisture content. On a small farm this will be done by the farmer or members of his family; on a large farm the workers either have to make these decisions or to follow the orders of their superiors, who may lack some of the required local knowledge. Where the best decisions are made also depends on the communication system between the decision-maker and the applied researchers. It is no exception that the level of competence and the level of motivation to make the right decision is higher on a family farm than on a large farm.

We see that the optimal farm size is influenced by the kind of support farmers get from co-operatives and other input supply and marketing agencies, from extension services, vocational agricultural schools, etcetera.

If the environment in which the farmer operates changes, the optimal farm size can change considerably as well.

7. Sustainability

Earlier I said that much of the present agriculture is not sustainable. This can be because:
- it causes soil erosion,
- it removes with the crops more minerals from the field than are replenished by fertilisers or manure,
- it uses so much irrigation water that the ground-water level drops,
- it causes salination of the fields,
- it causes pollution of the soil or of the ground water, for example, with pesticides,

At the same time as we said, in developing countries a rapid increase in agriculture production is necessary to meet the growing demand for food. This can be realised by increasing the area under cultivation or irrigation or by increasing the yields per ha. Often all the land which is not yet brought under cultivation is quite susceptible for erosion. That renders it non-sustainable in meeting the growing demand for food by expanding the cultivated area. Also increasing the irrigated area is often non-sustainable because of the shortage water. Therefore, we have to find ways to increase the yields by using the available resources in the most efficient way. This requires a high level of knowledge from the farmer. In the past one thought only of knowledge from research, now we realise that indigenous knowledge and knowledge from the experience of the farmer and his colleagues is also important. However, it is not possible to obtain optimal yields by using only indigenous knowledge, because the environment is changing rapidly and researchers can make and analyse observations which farmers cannot. For instance, the population of Tanzania has increased fourfold in the past 40 years. In the past, one could restore the fertility of field by keeping it for a long period in fallow, but now one has to find other ways to do so.

Some people believe that low external input agriculture is more sustainable than a farming system in which fertilisers are used. This is not true (Meertens, 1999). If, for instance, one increases the crop yields with 25% by introducing a nitrogen fixing crop in the rotation than the harvest will remove 25% more phosphate, potash and other minerals from the field. Unless these are replenished the soil fertility will decrease by cultivating this crop. Sometimes animal manure is available to do this. An advantage of this manure is that it contains different minerals more or less in the quantity the crop needs. If one uses fertilisers the farmer should have a good knowledge of the optimal balance of the different minerals needed for his crop. If he has this, he can achieve a better balance than with manure, but not too many farmers, certainly in developing countries, have this level of knowledge.

If by fertilisers and/or farm-yard manure more minerals are added to a field than are removed with the crop, this can cause pollution of the soil and/or the ground water. This can make it very costly to make good drinking water from the ground water. This is a problem in many industrial countries. In the Netherlands, for example, some time ago many farmers added with fertilisers some 400 kg N per hectare of pasture in addition to the N from the farm-yard manure and the grazing animals. There are now government regulations which limit the amount of different minerals which a farmer is allowed to bring to a field. Not many farmers in developing countries use such high quantities of fertilisers to cause a pollution problem. Pollution by pesticides may happen there.

Sustainable agriculture often requires a good system erosion control and the optimal use of

irrigation water. This will require collective decision-making, because the way one farmer farms influences also the fields of his neighbours.

Farmers will only use the inputs needed to maintain their soil fertility when they consider this profitable. Here we encounter two difficulties:
- Many farmers calculate profitability in a different way than agricultural economists. They calculate with the money which is entering and which is leaving the farm, but they do not calculate interest on their own capital, depreciation of the investments they have made or the value of the products their family consumes. In West Africa, for example, farmers use fertilisers for their cotton, but not for the food crops they consume themselves. Using fertilisers on their cotton will increase the amount of money which enters the farm by selling more cotton. This can be a profitable investment. Increasing the quantity of cereals they consume in their family is their way of calculating, not profitable.
- There are also situations where the high price of fertilisers and the low price of crops render it non-profitable in the short run to use fertilisers. This may be because of the high transport and handling costs of the fertilisers and the crops. In the long run this will result in a decrease in soil fertility, but that is not of interest for a farmer who does not survive in the short run.

8. Poverty among farmers and farm labourers

A large proportion of the poor in the world are small farmers and farm labourers (Bellerby, 1956). Therefore, policies to reduce poverty, both national policies and development co-operation, have to pay attention to the way agriculture is developing. Reducing poverty is possible through:
- Increasing the productivity of farmers. If this is realised among a small group of farmers, they will be better able to compete with other farmers, who less increase their productivity, but if many farmers increase their productivity, the prices of their products will decrease and usually also their income.
- Producing what the market demands; with economic development these demands are changing.
- Decreasing the proportion of the labour force in agriculture. Is there alternative employment for those who leave or do not enter agriculture?
- Increasing the prices of agricultural products through price policies. The costs of the policies will have to be paid by the taxpayers and/or the consumers.
- Empowering farmers to give them more influence over their situation. This usually implies a decrease in power for moneylenders, landlords, merchants, urban based politicians, etcetera. They will resist this decrease in power.
- Liberalisation of international trade to increase the possibilities to export agricultural products and to decrease the possibilities for foreign countries to dump the surpluses they produce in the local market (Watkins, 1995).

In many East and South Asian countries the incidence of poverty has decreased a lot since 1960, but in the poor, mainly African, countries policies to reduce poverty have had limited effect. The difference in the average income between the rich and the poor countries have increased rapidly during the last decades (UNDP, 1999). At the same time through the improved communication and the decreased travel costs poor people now realise much better than in the past that other people are rich. This is a serious danger for the social stability in our world.

Between 1920 and 1940 the average income of farmers in the Netherlands was around 40% of the industrial labour earnings (Bellerby, 1956: 202), whereas in recent decades these income where about equal. This reduction of poverty among farmers has probably been caused by an increase of the productivity of Dutch farmers, which enabled them to increase their exports, the opening of export markets in the European Union and an orientation towards market demands, for example, by increasing flower production. However, the present Minister of Agriculture in the Netherlands is trying to change the direction of this development of agriculture, because it is causing serious environmental problems and using too much energy. With a population density per square kilometre of 400 pigs, 2500 chicken and 100 heads of cattle large surpluses of manure are produced. About one third of the value of agricultural production is produced in glasshouses, which require a lot of energy for heating. It is not easy to reduce poverty among farmers in a sustainable way.

Experiences with and research on policies to decrease poverty are discussed more thoroughly in Lipton (1989), World Bank (1990) and Watkins (1995).

9. Scientific developments

The discussion above shows that in order to meet the increasing demand for food in a sustainable way it is necessary to make full use of new scientific developments. At the moment there is perhaps the most progress in the field of communication and information technology, of biotechnology and of agronomy.

Information and communication technology (ICT) can mainly be used in two ways. Firstly, one can make simulation models of the growth of crops and animals and make observations how they are actually growing. This makes it possible to predict where one can interfere in the production circumstances in order to use the available resources more effectively. The difficulty is that it is relatively easy to generate a lot of information on the growth process, but it requires a high level of competence to interpret this information correctly and to use it effectively for improved decision making. This development of ICT may increase the gap in productivity between the very competent and the not so competent farmers.

Secondly, this technology can be used for communication between the different actors in the production chain and improve the management of the whole chain as was discussed on p. 147. Companies who do not use the opportunities ICT offers to collaborate with others in the chain, will have difficulties to compete in the market (The Economist, 1999).

The introduction of the high yielding varieties of cereals in the nineteen sixties has increased crop yields a lot and in this way prevented the starvation of millions of people. Now much of the potential of this scientific breakthrough has been realised, we need new scientific developments to meet the increasing demand for food. Many scientists expect that biotechnology will be one of the ways by which such a breakthrough can be realised, although it is clear that this development is not without risks. It is important to stimulate the realisation of potentials which are realised in the interest of farmers and consumers, but patents on biotechnological discoveries may make this difficult. Realising this potential requires that both producers and consumers acquire a realistic understanding of the consequences of using or not using the results of biotechnological research in agricultural production. In many developing countries a consequence of not using this research may be the starvation of a large number of people.

In agronomy a research tradition is developing which integrates knowledge from different scientific disciplines with careful observations of plant growth and of conditions influencing this growth. In this way location-specific knowledge is developed which shows how one can create conditions in which the plants make optimal use of the available nutrients and other resources. This makes it possible to replace a good deal of the pesticides used for plant protections by knowledge of insect ecology (e.g. Roling and van de Fliert, 1998). There are also indications that by integrating knowledge from breeding, physiology, soil science, plant protection, agronomy and socio-economics under certain circumstances it is possible to obtain considerable higher yields than are obtained at the moment with less fertilisers, irrigation water and other resources (Stoop, in print). This requires fairly large investments in agricultural research as we have to discover how scientific principles can be applied to realise optimal conditions for plant growth in different locations. It also requires well-trained farmers who are able to apply this knowledge in the conditions of their fields. This calls for more capable farmers than those who followed in the past blanket recommendations, which were not optimal for their situation.

10. Implications for extension organisations

This discussion of agricultural development has many implications for agricultural extension. I will mention some which I consider important.

Agricultural extension agents often give recommendations about new technologies. However, in countries where the demand for more expensive agricultural products increases, a change in farming system has more potential to increase farm income, for example, a change from cereal to vegetable production. This

requires not only different extension messages, but also different extension methods. It is no longer possible to give a recommendation, but the extension agent should rather help the farmer to decide for himself which farming system he prefers and how much risk he is willing to take. For taking this decision the farmer should learn from the experience of his/her colleagues, who changed their farming system earlier, from their own experience and from information sources which can provide information about developments on the market.

The extension organisation will have to decide on which decisions it tries to help its farmers. This can be, for example, on the adoption of new technologies, on the management of these technologies, on the choice of their farming system and on the decision whether or not the family will try to earn most of its income from farming (van den Ban, 1998). This choice will have important implications for the competencies which are required of the extension agents both with regard to what to teach and how to teach. It may be wise for the managers of an extension organisation to decide that they will not try to help farmers with all the decisions they have to make, but to concentrate on one kind of decision in which the staff of this organisation is really competent. A privatised extension organisation can decide, for example, to concentrate on crop protection only and employ scouts to observe for the farmers who are willing to pay for their services, which diseases there are in their crops and to give advice how these crops can be protected (van den Ban, 1999). It is also possible that an extension organisation decides to use the confidence it has gained among the farmers when giving advise on plant protection by discussing with farmers what in their situation is the optimal choice of a farming system. For this kind of advice it is very important that the farmer trusts his extension agent.

Extension organisations will have to decide which developments in agriculture they will try to support in order to reduce poverty among farmers and farm labourers.

A farmer can develop his farm in different directions. He can,for example, increase his labour productivity by enlarging the scale of his farm in order to be better able to compete with other farmers or he can also try to make his farming system more sustainable. Some farmers will choose for one direction and others for another. Can one adviser help both of them to do this as effectively as possible or will the adviser try to impose the choice he would make, if he were a farmer, on all his clients? One may say the adviser should work in a non-directive way and help the farmer to achieve his own goals, but is it realistic to expect that the adviser is not guided in his interaction with farmers by his own preferences? If the adviser be a government officer, what will than be the impact of government policies on his behaviour?

Some time ago I gave a lecture in Poland on ‘The role of extension in agricultural development’. In the discussion it was pointed out to me that in Poland 23% of the labour force is employed in agriculture, but there is no way in which all of them can earn a decent living from agriculture. However, if half of them would not only leave agriculture, but also the rural areas, this would create serious social problems. Therefore, they are more interested in rural development than in agricultural development. I had to admit that they are right. One often expects from extension that it will decrease poverty among the farmers. This is seldom possible unless a substantial proportion of the people now working in agriculture, finds employment outside agriculture. Helping the farm family to decide whether or not to continue to work in agriculture and if not which alternative employment and where is more attractive, should be an important role of an (not of any) extension service.

A Dutch farmer once said: “Agriculture is like a race, but the only price you get if you have won the race, is that you are allowed to participate in the next race” (Constandse, 1964). Only the most efficient farmers can continue to farm and earn a decent income. This is not only true at individual level, but also at the national level. Farmers in a country where the productivity in agriculture increases rather slowly, will have serious difficulties in competing with their colleagues in other countries. The process of increasing productivity can be quite painful for some farmers, but policies which try to avoid this pain will be more painful in the long run.

Government policies to protect farmers from international competition have in the long run usually a detrimental effect on the ability of the

farmers in this country to compete on the market. For example, around 1880 farmers in Western Europe were in serious difficulties because the development of railways made it possible to send cheap grain from the Midwest of the USA and the Ukraine to Europe. The German government decided to protect their farmers through import duties. The Dutch government could not do this, because the limited development of industry in the Netherlands made it impossible for the population to pay the higher food prices. As a result Dutch farmers could feed their pigs and poultry with cheap grain and sell their products in the German market. For the next hundred years these German import duties on grain enabled Dutch farmers to compete well on the German market for animal products.
Recently a US dairy extension officer told me that he expects a similar development with the milk quota in the European Union, because these quota make it difficult for European dairy farmers to increase the efficiency of their production and hence, make it difficult to compete with US or New Zealand dairy farmers, when a free trade in dairy products begins under WTO rules. He may be right. It is important for farmers to understand this process, but how can one tell it them in such a way that they accept this unpleasant message? Which extension organisation sees it as their duty to tell this to farmers?

A major factor in the ability of farmers to compete in the market is their knowledge and managerial ability and their co-operation with other actors in the chain from input suppliers and producers to consumers. Agricultural extension should try to increase this knowledge and managerial ability including the ability to influence this marketing chain. This implies that agricultural extension is not only a branch of communication, as some European extension scientists think, but in the first place a branch of adult education as it is generally accepted to be in the USA. Learning how to learn will often be more important than learning new research findings. I have discussed elsewhere when it is desirable to switch from extension to consultancy (van den Ban, in print).

Farmers in developing countries have difficulties increasing their productivity at the same rate as is done by farmers in industrial countries. Possibilities for them to compete include:
– profiting from the growing domestic demand for food, especially for horticultural and animal products, which are difficult to import from industrial countries,
– profiting from their advantages through low wages and a good climate in certain times of the year to export to industrial countries, for example, fruits and flowers. This requires a high level of knowledge and a good organisation of the market to be able to produce the quality consumers expect,
– decreasing the proportion of the labour force working in agriculture by increasing the employment opportunities outside agriculture,
– competing with other developing countries through a higher level of competence of the field-level extension agents.

In the past, agricultural extension services gave mainly recommendations for individual decisions by farmers, for example, on the use of fertilisers. To promote more sustainable farming systems much attention should be given to collective decision making. These collective decisions are also important in increasing the influence farmers have in the marketing chain and the access that poor population groups have to resources.
It is difficult to meet the increased demand for food in a sustainable way. An alternative would be to decrease the demand for food in industrial countries, where people consume more calories and more meat than is good for their health. However, realising this decrease is a major communication problem.

A major role of extension agents used to be to provide farmers with new information. At present Information and Communication Technology, for example, the Internet, can take over a good deal of this role and provide more up-to-date information at a lower cost. Farmers now need to find the information which is most relevant for the decisions they have to make, to evaluate this information and to integrate information from different sources including information from the farmer himself about his experiences, his resources and his goals. Some of the information on the Internet is quite valuable, but as some of it is only confusing or even misleading.
ICT can also play a major role in communication in the extension organisation, for example, for staff training, and in the communication between extension agents and other actors in the Agricultural Knowledge and Information System, e.g. researchers.

One can argue that an extension organisation should use its limited resources mainly to help farm families with the most important decisions they have to make (Hoffman, 1994). The decision whether or not to change from crop production to vegetable production or the decision whether or not the son should be trained to become a farmer are clearly more important for the welfare of the farm family in the future than the decision on how much potash to give to the potato crop. Such a change in the focus of the extension organisation has many implications for the training of the extension staff and the financing and the management of the extension organisation.

Several years ago an extension officer employed by a Dutch farmers' association gave a lecture for a local branch of their organisation in which he discussed why urban people are becoming more interested in the way farmers are farming. He saw important changes coming in the social environment in which their farmers operate and was convinced of the importantance of being aware of these changes. The reaction of many farmers was: "Damn, now even a staff member of our own organisation has joined the enemy". Farmers do not like to hear about changes in their environment, which threaten their way of farming and their way of life (Hruschka, 1969). The experience has shown that the analysis this extension officer made of the changes in the environment of the farmers was correct, but how could he have brought this message in such a way that it would have been accepted by farmers as correct? In the present era in which the future of many farmers is threatened, this is an important question for extension scientists.
The present tendency towards participatory approaches in extension can make it difficult to help farmers to realise which changes in their environment threaten their future. On the other hand, creating a situation in which the farmers analyse themselves how their environment changes can be the most effective way to get this messages accross.
Is it possible for a privatised extension organisation to tell farmers how their future is threatened by changes in their environment? Are farmers willing to pay somebody for bringing this information? (van den Ban, in print). Many farmers in the European Union do not realise that they get about half of their income from the market and the other half from government policies. One of the reasons is that it does not pay for staff members of a farmers' organisation to tell this to their members. The result is that many farmers do not have a correct perception of the chance that government support for agriculture will decrease and do not think in time about how they should react to such a change in price policy.

Our discussion indicates that extension organisations can be very useful to society and to farmers by performing different roles than they have performed in the past. This requires a major change in extension organisations including a retraining of their staff, the use of different sources of information than those on which one relied in the past and a change in extension methods. Managing this process of change is in this era a major task for the leaders of extension organisations (van den Ban, 1997). Problems in this process of change include:

- in these decisions farmers are even more influenced by their emotions than in decisions on the adoption of new production technologies. The decision whether or not to continue farming is, for example, influenced by the consequences this has for the social status of the farm family, the perception that leaving agriculture shows that the farmer has failed to be a successful farmer and the fear of loosing the freedom he had by being his own boss,
- farmers may expect a concrete recommendation, because they have learned that this is the role of their extension agent and because they cannot accept the uncertainty about taking a decision themselves, whereas the extension agent is convinced that it should be his role to help the farm family to take their own decision.
- it is not necessary that a farmer is aided in solving all his problems from one extension organisation. A pluralistic extension system may work better (Christopolos and Nitsch, 1996), but how can such a system be developed in such a way that synergy is achieved between the different organisations involved in a time in which they also compete for money?

11. Concluding remarks

This article gives my personal views on agricultural development and on the implications of this development for agricultural extension. Other people will consider some developments which I have not mentioned as more important

and will have a different view on these developments as I have. Managers of extension organisations should not accept my views as correct, but think seriously which goals their organisation should try to achieve in order to make an optimal contribution to the development of agriculture in their own country. Their conclusions will depend on the agro-ecological and the socio-economic situation and also the agricultural development policy of their government. It was not possible to discuss these country specific aspects of the development process in this article. Also I have not given much attention to the question when a participatory extension approach is desirable, because there is a lot of literature on that subject, for example, van den Ban and Hawkins (1996).

Acknowledgement

Comments from M.D.C. Proost on an earlier draft helped to improve this article.

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